

DER Approval of Repair and Alteration Data

DER Recurrent Seminar Presentation by
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November 2003

PURPOSE

- To review the applicable policy:
 - FAA Order 8110.37C (DER Handbook) - paragraph 611 - Repairs and Alterations.
 - FAA Order 8110.45 (New) - Use of Data Approved by DER's to Support Major Alterations.
 - FAA Order 8300.10 Change 16 (New) - Major Alterations that Require an STC.
- To discuss procedures for DER's approving data in support of major alterations and repairs.

OUTLINE

- Definitions
- Required DER Authorizations
- Alterations and the new FAA Orders
- Repairs
- Substantiation and Communication of DER Approved Data
- DER Do's and Don'ts

DEFINITIONS

- **Alteration** - The modification of a type certificated product from one sound state to another sound state; the product meets the original airworthiness specifications (per the original cert basis) both before and after the modification.
- **Repair** - The restoration of a damaged, or worn type certificated product, appliance, or component in a manner that returns it to its original airworthy condition with regard to aerodynamic function, structural strength, resistance to vibration, deterioration, and any other characteristic affecting airworthiness.

DEFINITIONS (cont.)

- **Major Alteration** - Any alteration not listed in the specifications of a type product that; a) might appreciably affect weight, balance, structural strength, performance, powerplant operations, flight characteristics, or other qualities affecting airworthiness; or b) is not done to accepted practices or cannot be done by elementary operations.
- **Major Repair** - Any repair to a type product, appliance or component that; a) if improperly done might appreciably affect weight, balance, structural strength, performance, powerplant operations, flight characteristics or other qualities affecting airworthiness; or b) is not done to accepted practices or cannot be done by elementary operations.

DEFINITIONS (cont.)

- **Minor Alteration** - Any alteration that is not a major alteration.
- **Minor Repair** - Any repair that is not a major repair.

Note: FAA engineering approval by a DER is not required for minor alterations or repairs. Repair Stations should maintain the documentation necessary to substantiate such assessments and show compliance with the applicable rules.

AUTHORIZION for ALTERATIONS and REPAIRS

- Specific appointing ACO authorization is required to approve data supporting major repairs and major alterations.
- Once authorized by the appointing ACO, DER's may approve technical data for major repairs and alterations without first notifying the project ACO, except when the part is critical or life limited or if the work is done outside the country.

Are you AUTHORIZED?

- The appointing ACO gives DER authorization by:
 - Appointment/Renewal Letter - Special Delegations (i.e. “Special - Major Repairs and/or Alterations”). Note: The LA-ACO does not use FAA Form 8110-25, Certificate of Authority - DER.
 - Project Specific Letter - Specific authorization given on a case by case basis.

ALTERATIONS

HOW are MAJOR ALTERATIONS APPROVED?

- **Field Approval** - An alteration to a type certificated product approved by the FSDO. Used when FSDO approves all or part of the technical data and signs Block 3 on FAA Form 337.
- **STC** - An alteration to a type certificated product approved by the ACO on FAA Form 8110-2.
- **DER & Mechanic with IA Approval** - An alteration to a type certificated product where the DER(s) approves all the technical data necessary and an authorized Aviation Mechanic with an Inspection Authorization signs FAA Form 337.

Reference: FAA Orders 8110.37C, 8110.45, & 8300.10

FAA ORDER 8110.45

Use of DER Approved Data for Major Alterations

- An altered product may be approved for return to service if the alteration was accomplished IAW FAA approved data.
- What if all the data is DER approved?
- DER approved data may not be sufficient by itself:
 - **fight manual supplements, airworthiness limitations, ground and flight tests, compliance inspections, modifications to critical structure or life limited parts, etc...)**

FAA ORDER 8300.10

Major Alterations Requiring an STC

- This Change to the Flight Standards Service Order 8300.10 “Airworthiness Inspector’s Handbook” contains lists of alterations that exceed the basic scope of a **Field Approval**. The lists are grouped into four categories: General Aviation, Rotorcraft, Engines and Propellers, and Transport Airplanes. The lists are comprised of various types of alterations an Inspector might be asked to address in the field. The Order also identifies which types of alterations **might** possibly be accomplished by means other than an STC.

Major Alterations Requiring an STC

- What are these “other means” of approval?
 - DER approves all necessary data and the person performing the work, if appropriately authorized, returns the product to service. (No need for FSDO to sign Block 3 of FAA Form 337 if all necessary data is approved.)
 - ACO engineer approves data and FSDO coordinates Field Approval.

INSTRUCTIONS for CONTINUED AIRWORTHINESS

- Instructions for Continued Airworthiness must be addressed for all alterations and should be referenced on FAA Form 337
- ICA requirements for alterations are the same as for an STC

REPAIRS

HOW are MAJOR REPAIRS APPROVED?

- A Repair Procedure, its corresponding technical substantiation, and any other supporting data submitted on FAA Form 8110-3 is considered FAA approved data when signed by an authorized DER.
- DER's should remind Repair Stations to coordinate with their local FSDO when incorporating DER approved Repair Procedures into their Opspecs/capabilities lists.

PARTS MANUFACTURED in SUPPORT of a REPAIR

- Production of detailed parts consumed as part of a repair do not require a PMA unless they are to be sold as replacement parts (ref: FAA Order 8110.42A).
- The technical data necessary to substantiate the adequacy of such a part should be DER approved as if pursuant to a PMA.
- The design details for such parts should be defined in the Repair Procedure document.

REPAIRS involving PROCESS SPECIFICATIONS

- **Repair Procedure** - The step-by-step process used to define the accomplishment instructions for a repair.
- **Process Specification** - A detailed and proven process requiring close control of certain process parameters to produce a desired result. May involve physical, chemical or metallurgical transformations that are not easily inspected (e.g., coating, heat-treat, welding, adhesive bonding, etc.).

Note: A Process Specification can be a sub-set of a Repair Procedure.

REPAIRS involving PROCESS SPECIFICATIONS

- While DER's can approve technical data supporting a Process Specification to be used by a Repair Station, DER's should remind Repair Stations that they are responsible for coordinating Process Specification "approvals" through their FSDO. (Note: Many FSDO's will coordinate with ACOs for approval of Process Specifications involving DER approved data.)
- DER's should not approve Generic Process Specifications for a Repair Station. (Generic Process Specifications are those not tied to a specific Repair Procedure.)

Reference FAA Order 8110.37C

SPECIAL DELEGATIONS for PROCESS SPECIFICATIONS

- For Structures Delegations* -
 - Must obtain special authorization for Process Specifications.
 - Metallic Materials/Processes
 - Non-metallic Materials/Processes
- All Other Delegations -
 - No special delegation required.

*Reference 14 CFR Part 23.603-23.605, 25.603-25.605

SUBSTANTIATING a REPAIR or ALTERATION

- Both design and substantiating data must be developed to show how the repaired or altered product meets all the requirements of the applicable regulations.
- Must show that repaired or altered products can function reliably within the approved envelope of the original product throughout its established inspection interval.
- May require testing and/or analysis.

ELEMENTS of a TYPICAL DER DATA PACKAGE

- Complete and accurate FAA Form 8110-3.
- A report outlining the scope and detail of the repair, applicability, basis of the repair, testing/analysis performed, and an explanation on how the applicable airworthiness standards were established and met.
- A copy of the Repair Procedure that includes a COMPLETE and ACCURATE set of step-by-step accomplishment instructions.
- Substantiating data used to show that the repaired part has recovered its physical and functional characteristics (e.g. strength, durability, toughness, shape, cooling and thermal protection, etc.)
- Copies of all applicable supporting information such as: service bulletins, maintenance manuals, and any other information used to establish the basis of the repair.
- Copy of test results and analysis.

NOTES to CONSIDER for 8110-3 “LIST OF DATA” BLOCK

“This approval is for engineering design data only and is not an installation approval.”

“This form does (or does not) constitute FAA approval of all the engineering design data necessary for substantiation of compliance to the necessary requirements for the entire alteration (or repair).”

“The _____ aspects only of the above listed data are approved herein.”

(Reference FAA Order 8110.37C and 8110.45)

NOTES to CONSIDER for 8110-3 “LIST OF DATA” BLOCK

“_____ compliance inspection is not included in this approval and requires separate ACO approval.”

“The requirements of FAR _____ are not included in this approval and require separate approval.”

“This approval is valid for _____ S/N _____ only.”

Reference FAA Order 8110.37C

DER DO's

- Note in the 8110-3 “Purpose of Data Block” that the purpose is in support of a major repair or alteration.
- Reference the serial number of the applicable aircraft, engine or propeller to which the data applies.
- obtain approval from appointing ACO before approving “standard repairs” that will be repeated multiple times.
- Coordinate with the appointing ACO for anything other than a complete repair such as a “interim/time limited” repair.
- Send the original FAA Form 8110-3 to the appointing ACO (& substantiating data package if requested)

DER DON'Ts

- Don't make Field Approvals and don't sign FAA Form 337 returning a product to service.
- Don't work in foreign countries without notifying the FAA Flight Standards International Field Office that has oversight.
- Don't "recommend approval" for areas outside of your delegated functions.